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SPECIAL REPORT

Update on the U.S. Cost of Capital

by Margo Thorning*

A Special Report *published by the ACCF Center for Policy Research in June 1989 documented that U.S. capital costs are high compared to those of our major international competitors. This* Special Report *updates that earlier report by providing new estimates of the cost of capital in the United States and in Japan. It also describes the effect of recent tax policy changes on the cost of capital for new, high-tech U.S. firms.*

What Is the Cost of Capital?

The cost of capital is the pretax return on a new investment needed to cover the purchase price of the asset, the market rate of interest, inflation, taxes, and the return required by the investor.[1] Capital costs are an important factor in determining which investments firms will make. High capital costs mean that only those projects with the greatest expected return will be undertaken because they will yield a return large enough to satisfy investors, resulting in less overall investment.

Why U.S. Capital Costs Are High

International comparisons based on the traditional, pretax return concept show that U.S. capital costs are approximately twice those of Japan, 60 percent higher than the United Kingdom's, and 30 percent higher than those of West Germany. Experts conclude that the current, high U.S. capital costs are due to three primary factors: (1) high interest rates; (2) the lack of indexing of depreciation allowances for inflation; and (3) federal tax code changes since 1982.

- *Capital Costs, Risk, and Interest Rates.* New research by Stanford University Professor John B. Shoven indicates that the U.S. cost of capital is higher than previously estimated. Professor Shoven's study[2] is a step forward in capital cost analysis because he incorporates a measure of

Chart 1: Cost of Equity Capital for Autos

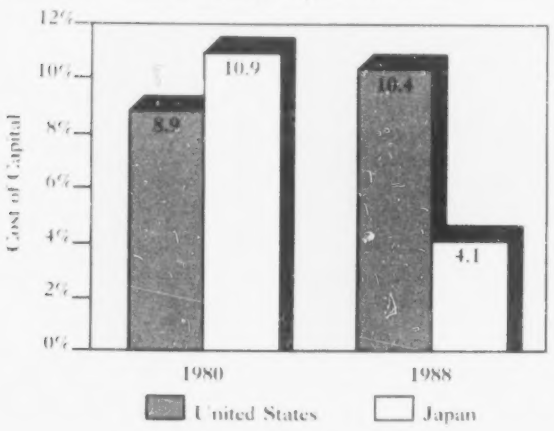
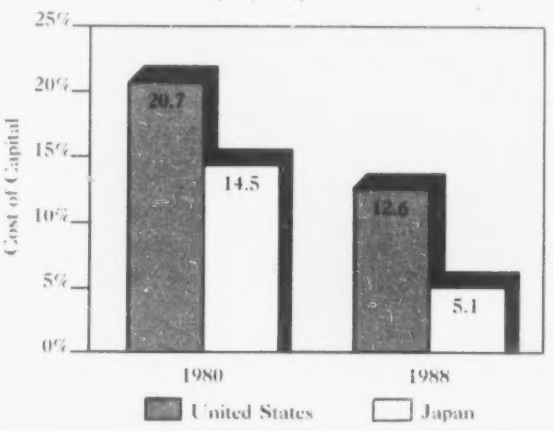


Chart 2: Cost of Equity Capital for Plants



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[1] Another frequently used measure is the user cost of capital—often called the "hurdle rate" because it measures the return an investment must yield before a firm would be willing to undertake the capital expenditure. For example, for a typical manufacturing firm to be willing to purchase a new piece of equipment given current tax law and economic conditions, the asset would have to yield an annual return of approximately 25 percent. This yield would cover all costs, including the purchase price of the equipment, real (economic) depreciation, financing costs, and taxes. The only difference between the user cost (or "hurdle rate") and the pretax return measure is that the former includes economic depreciation (about 15 percent per year for equipment, for example). Economic depreciation, which measures the actual useful life of an asset, does not vary with the tax code.

Chart 3: Cost of Debt Capital for Autos

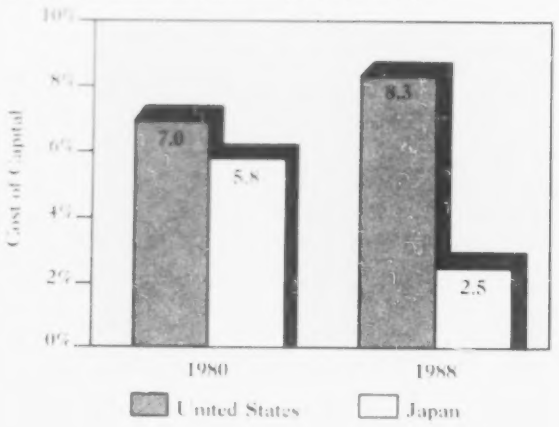
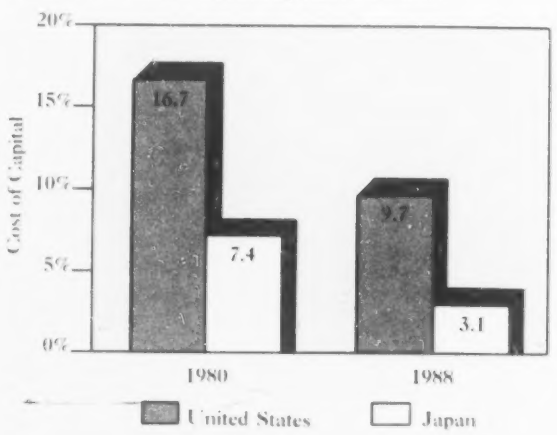


Chart 4: Cost of Debt Capital for Plants



the risk premium actually demanded by investors in the traditional pretax return measure, whereas previous studies used the unrealistic assumption that the risk premium could be measured by the real interest rate on safe, short-term government bonds. Using his more realistic measure of the pretax return required by investors, Dr. Shoven concludes that the U.S. cost of capital is significantly higher than that of Japan and that the U.S. tax system discriminates against risky investments.

In his analysis, Professor Shoven measured the cost of capital for an asset with an assumed 5-year life (an automobile) and with a 31.5-year life (a plant) for the years 1980 and 1988 in both the United States and Japan (see Charts 1 and 2). He found that the cost of capital for equity-financed automobiles in 1988 was 10.4 percent in the United States compared to Japan's 4.1 percent, a difference of 153 percent; U.S. plants financed with equity faced capital costs 147 percent higher than Japanese plants.

Debt-financed investments in the United States also incur substantially higher capital costs than in Japan, according to Dr. Shoven's research. Capital costs for U.S. investments in autos using debt financing are 232 percent higher and in plants are 212 percent higher than comparable investments in Japan (see Charts 3 and 4). Dr. Shoven concludes that the U.S. tax system affects the cost of capital far more than previously recognized.

Dr. Shoven indicates that the interaction between high U.S. nominal interest rates and depreciation allowances may explain a substantial portion of the observed differences between U.S. and Japanese capital costs. For example, with a zero nominal interest rate, depreciation deductions, even if spread over thirty years, are equivalent to expensing; corporate taxes therefore do not affect capital costs. With a 10 percent interest rate, however, deductions occurring more than, say, fifteen years in the future are worth no more than twenty cents on the dollar. This means that the present value of the taxes saved with the depreciation deductions is not large enough to permit full recovery of costs, thus raising the cost of capital. The crucial importance of the nominal interest rate may explain why Japan's corporate income tax has a smaller effect on capital costs than does the U.S. corporate income tax.

- *Capital Costs and Tax Policy.* Changes in tax law subsequent to the passage of the 1981 Economic Recovery Tax Act (ERTA) have increased both the pretax return required by investors and the hurdle rate a firm's projects must meet. Capital costs of investment in equipment (using the pretax return measure), for example, have risen almost 90 percent since 1982 (see Chart 5).

The effective tax rate on new investment reflects the cost of capital. After the passage of ERTA in 1981, the effective tax rate on equipment approximated theoretical expensing; by 1986, when the Tax Reform Act (TRA) was enacted, the rate increased to 46.3 percent, which exceeds the statutory tax rate of 34 percent (see Chart 6). The loss of the investment tax credit and the lack of inflation indexing for depreciation are the major reasons why the effective tax rate exceeds the statutory rate.

Research by Dr. Yolanda Henderson, an economist with the Federal Reserve Bank of Boston, also leads her

[2] John B. Shoven, "Consumption Taxes vs. Income Taxes for Deficit Reduction and Tax Restructuring," prepared for "Saving: The Challenge for the U.S. Economy," a symposium sponsored by the American Council for Capital Formation Center for Policy Research, October 1989.

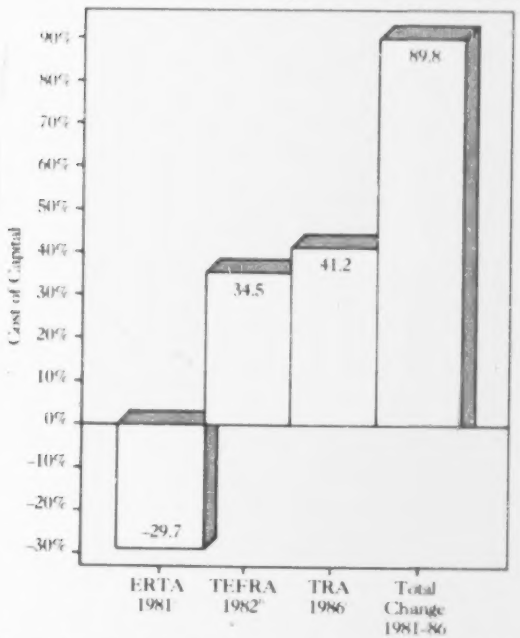
to conclude that the Tax Reform Act of 1986 significantly increased the U.S. cost of capital.[5] Dr. Henderson further concludes that the required pretax return would have risen only half as much as it did if the capital gains tax rate had not been raised in 1986. Higher capital gains taxes mean that for any given after-tax rate of return required by investors, the pretax return must be larger; thus, the cost of capital firms face is higher.

Effect of the U.S. Tax Code on Small, High-Tech Firms

Dr. Henderson also observes that TRA, by eliminating the capital gains differential, exacerbated the tax differential between corporate equity and debt, thus making the use of debt even more advantageous than before. Her research indicates that small firms, particularly high-tech companies, have limited access to debt, in contrast to larger firms. For example, long-term debt-to-equity ratios for mature corporations average 42 percent in manufacturing and 107 percent in services, with other industries falling in between (see Table 1). The mean ratios for emerging companies are typically higher (except for services) but are distorted upward not only by selected companies with high use of debt but also by those with very low values of shareholders' equity as a result of operating losses in early years.

The median values of debt-to-equity, which mark the division between the bottom and top halves of the sample, are a better indicator for the typical emerging company in each industry. These median values confirm the findings of low usage of debt: The ratio is 20 percent in manufacturing and 16 percent in services. The median debt-equity ratio of high-tech service firms is only 13.5 percent. Henderson suggests that the use of specialized equipment such as computers or medical equipment or other assets not suitable for collateral may contribute

Chart 5: Impact of U.S. Tax Code Revisions on the Cost of Capital for Equipment Used in Manufacturing (Pretax Return Basis)



Source: Congressional Research Service, Library of Congress, "Effects of Alternative Tax Regimes on the Cost of Capital for Selected Types of Equipment," February 1989 (unpublished). Chart prepared by the American Council for Capital Formation.

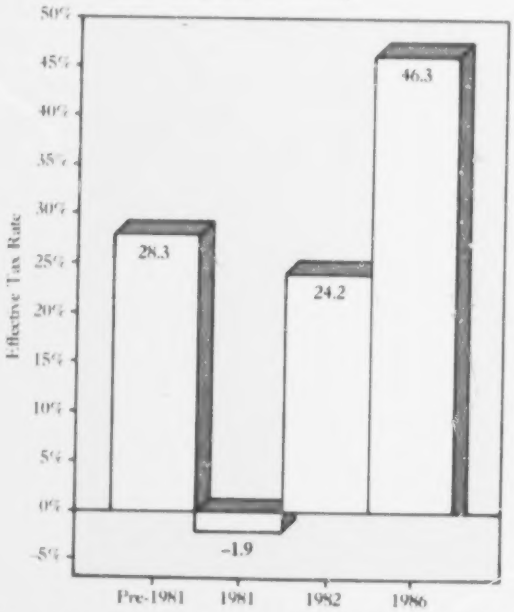
Note: The capital cost used here is the pretax return required by an investor, which is net of economic depreciation.

*The Economic Recovery Tax Act of 1981 (ERTA) reduced rates compared to prior law.

†The Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) reduced ERTA's investment incentives.

‡The Tax Reform Act of 1986 (TRA) further reduced the investment incentives available under TEFRA and raised effective tax rates to a level higher than that prevailing in 1980.

Chart 6: Effective Tax Rates on Equipment Used in Manufacturing



Source: Congressional Research Service, Library of Congress, "Effects of Alternative Tax Regimes on the Cost of Capital for Selected Types of Equipment," February 1989 (unpublished). Chart prepared by the American Council for Capital Formation.

[5] Yolanda K. Henderson, "Capital Gains Taxation and the Cost of Capital for Mature and Emerging Corporations," prepared for "Saving: The Challenge for the U.S. Economy."

Table 1: Long-Term Debt-to-Equity Ratios for Mature and Emerging Corporations by Industry, 1986[a]
(Percent)

	Mature	Emerging		Sample Size (Number of Companies)	
		Mean	Median	Mature	Emerging
Total Nonfinancial	58.6	122.5	22.2	422	210
Manufacturing	42.4	115.3	20.1	245	86
Food and Tobacco	62.3	86.1	17.3	93	5
Chemicals	43.4	64.7	2.3	137	10
Industrial and Computing Equipment	30.1	37.9	9.3	224	8
Electronic Equipment	26.8	39.8	16.7	123	17
Measuring Instruments	25.9	91.5	5.1	99	9
Miscellaneous Manufacturing	48.5	112.6	2.8	41	7
All Other Manufacturing	47.8	213.3	49.6	528	30
High-Technology Industries[b]	n.a.	43.9	6.1	n.a.	37
Non High-Technology Industries	n.a.	165.1	43.7	n.a.	53
Transportation, Communication, Utilities	82.6	241.9	80.5	370	21
Wholesale Trade	67.6	348.4	39.2	153	14
Retail Trade	76.5	89.2	43.6	291	26
Services	106.8	42.9	16.3	249	60
Technology-Oriented Industries[c]	n.a.	39.6	13.5	n.a.	40
Non Technology-Oriented Industries	n.a.	49.3	19.4	n.a.	20

Source: Compustat Industry Aggregate Database and *Going Public: The IPO Reporter.*

[a] For mature corporations, the ratios are value-weighted means. Bernanke and Campbell (1988) indicate that means and medians are similar in the Compustat sample. For emerging corporations, they are means and medians of ratios for individual companies averaged before and after their initial public stock offering. Observations are omitted if equity is negative. Individual industries are shown separately if there are at least six observations of companies going public in 1986. All ratios are book values.

[b] SIC codes 283 (drugs), 286 (industrial organic chemicals), 357 (office and computing equipment), 366 (communications equipment), 367 (electronic components), 372 (aircraft), 376 (missiles), 380 (instruments). Definition from U.S. Congressional Budget Office (1985).

[c] SIC codes 737 (computers and data processing), 7389–7399 (business services), 805–807 (health services), 8731 (commercial physical research), 8734 (testing laboratories).

to low debt ratios in the high-tech sector. Except for transportation, communication, and utilities and the category of all other manufacturing—industries not shown separately because of low instances of initial public offerings—the debt-equity ratios are substantially below those measured for mature industries.

The accessibility of long-term debt is important for the analysis of the cost of fixed capital, such as plant and machinery. Because these assets have relatively long lives, risk-averse firms are unlikely to finance them with short-term loans that must be renegotiated each year. The relevant choice is between long-term debt and equity.

Any increase in the cost of equity funds is likely to impose a disproportionate burden on emerging corporations, discouraging their growth, Henderson observes. The typical young corporation finances a lower proportion of its assets by issuing debt and has a lower debt-to-equity ratio than does the typical mature corporation. This comparison is especially sharp in the services sector. Technology-oriented companies also have particularly low access to debt.

Although economists disagree on exactly how capital gains taxes and dividend taxes affect the cost of equity, and therefore on whether equity is more expensive for emerging than for mature corporations, they generally recognize capital gains taxes as a significant element of this cost. Furthermore, Dr. Henderson notes, recent research indicates that a lack of internally generated funds serves as a constraint on investment beyond what an

analysis based solely on tax policy would indicate. The need of young corporations to issue new shares hampers their capital expansion plans.

The cost of funds—both equity and debt—depends on whether investors and creditors are subject to taxation on their income. Mature corporations have relatively greater access to untaxed institutional investors such as pension funds and therefore can afford to undertake investments with pretax returns lower than those undertaken by emerging corporations. Investors in young corporations are more likely to be individuals subject to capital gains taxes.

Dr. Henderson concludes that the additional cost of equity funds caused by the increased capital gains tax rates of TRA imposes a disproportionate burden on new companies. Lower availability of debt, all else being equal, means that emerging corporations face a higher cost of capital because of their inability to take advantage of tax incentives for this form of finance. Many experts believe that new, technology-oriented companies are important for international competitiveness, both because of their own potential for growth and because of the spillover benefits of their research for other sectors.

Conclusions

Reducing the U.S. cost of capital, which is vital to investment and productivity growth, can be accomplished in several ways. First, lower interest rates would have a positive effect. Reduction of the federal deficit would be beneficial in this respect. Second, helpful changes in federal tax policy include: (1) expensing for all types of investment, (2) indexing both depreciation allowances and interest income and expense for inflation, (3) reducing capital gains taxes, and (4) integrating the corporate and personal income tax systems.

The ACCF Center for Policy Research is the education and research affiliate of the American Council for Capital Formation. Its mandate is to promote an understanding by the public of the importance of capital formation to the economy. For additional information please contact: ACCF Center for Policy Research, 1850 K Street, N.W., Suite 400, Washington D.C., 20006, (202) 293-5811.